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Lesson Title: Climate and Crops

Content Area(s): Science, Language Arts

Grade: 4th

**Standards**

**Standards**

FL.LA.A.1.3

The student uses the reading process effectively.

FL.LA.A.1.3.3

...demonstrates consistent and effective use of interpersonal and academic vocabularies in reading, writing, listening, and speaking.

FL.LA.A.1.3.4

...uses strategies to clarify meaning, such as rereading, note taking, summarizing, outlining, and writing a grade level-appropriate report.

FL.LA.B.1.3

The student uses writing processes effectively.

FL.LA.B.1.3.1

...organizes information before writing according to the type and purpose of writing.

FL.LA.B.1.3.2

...drafts and revises writing that: is focused, purposeful, and reflects insight into the writing situation; conveys a sense of completeness and wholeness with adherence to the main idea; has an organizational pattern that provides for a logical progression of ideas; has support that is substantial, specific, relevant, concrete, and/or illustrative; demonstrates a commitment to and an involvement with the subject; has clarity in presentation of ideas; uses creative writing strategies appropriate to the purpose of the paper; demonstrates a command of language (word choice) with freshness of expression; has varied sentence structure and sentences that are complete except when fragments are used purposefully; and has few, if any, convention errors in mechanics, usage, and punctuation.

FL.SC.D.1.4.3

...knows that changes in Earth’s climate, geological activity, and life forms may be traced and compared.

FL.SC.H.1.3.3

...knows that science disciplines differ from one another in topic, techniques, and outcomes, but that they share a common purpose, philosophy, and enterprise.

FL.SC.H.3.3.3

...knows that in research involving human subjects, the ethics of science require that potential subjects be fully informed about the risks and benefits associated with the research and of their right to refuse to participate.

FL.SS.A.1.3.2

...knows the relative value of primary and secondary sources and uses this information to draw conclusions from historical sources such as data in charts, tables, graphs.

FL.SS.A.1.4.4

...uses chronology, sequencing, patterns, and periodization to examine interpretations of an event.

**Resources**

**Resources**

[World Climates](http://www.blueplanetbiomes.org/climate.htm" \t "_blank)

Have you ever wondered why one area of the world is a desert, another a grassland, and another a rainforest? Why are there different forests and deserts, and why are there different types of life in each area? The answer is climate. Climate is the characteristic condition of the atmosphere near the earth's surface at a certain place on earth. It is the long-term weather of that area (at least 30 years). This includes the region's general pattern of weather conditions, seasons and weather extremes like hurricanes, droughts, or rainy periods. Two of the most important factors determining an area's climate are air temperature and precipitation. World biomes are controlled by climate. The climate of a region will determine what plants will grow there, and what animals will inhabit it. All three components, climate, plants and animals are interwoven to create the fabric of a biome.

[Effects of climate change on crops](http://www.youtube.com/watch?v=JaUItiaeLBU)

The effects of climate change on crops - part of our Research Showcase series. One of the major challenges of climate change is to use climate models to help us predict the effect on food crops in the future. We need to assess how changes in temperature and rainfall will affect the productivity of our food crops. We also need to consider how the variability of climate will alter, and look at how we can forecast this. How can agriculture adapt to offset the negative effects of climate change, and make the most of any opportunities which might occur?

[Geography Basics: Climate, Water, etc.](http://learn360.livetext.com/misk5/learn360/227274)

Our world

[Climate and Seasons](http://learn360.livetext.com/misk5/learn360/132510)

Explains Earth

[Climate](http://learn360.livetext.com/misk5/learn360/128931)

This video explains what climate is and explores the factors that make up different climates. Learn about the effect on climate of longitude and latitude, temperature, wind movement, air currents, precipitation, and altitude.

[Real World Science: Weather and Climate](http://learn360.livetext.com/misk5/learn360/131348)

How do meteorologists predict the weather? Understand important weather terms and find out how air, water, and heat work together to make the weather. See how warm air and cold air behave through easy to understand animations and explanations. Hear a definition of climate and watch as the definitions of climate zone and season are made clear.

**Rationale for Teaching This Lesson**

Living in the United States there is a sheer diversity of land, climate, and crops. As a teacher I believe that this lesson will help the students learn and understand the different climates within the United States that provide its inhabitants with produce.

**Key Concepts and Terms**

**Climate**: is the composite or generally prevailing weather condition of a region, as temperature, air pressure, humidity, precipitation, sunshine, cloudiness, and winds, throughout the year, averaged over a series of years.

**Crops**: the cultivated produce of the ground, while growing or when gathered.

**Produce**:  agricultural products collectively, esp. vegetables and fruits.

**Arable Land**: capable of producing crops; suitable for farming; suited to the plow and for tillage.

**Harvest**: to gather (a crop or the like); reap.

**Irrigation:**  the artificial application of water to land to assist in the production of crops.

**Region:** a large indefinite location on the surface of the Earth.

**Tropical Climate:** are known for their high temperatures year round and for their large amount of year round rain.

**Dry Climate:** are characterized by little rain and a huge daily temperature range.

**Humid Climates:**  these climates have warm, dry summers and cool, wet winters.

**Continental Climates:** can be found in the interior regions of large land masses. Total precipitation is not very high and seasonal temperatures vary widely.

**Cold Climates:** areas where permanent ice and tundra are always present. Only about four months of the year have above freezing temperatures.

**Behavioral Performance Objective**

By the end of this lesson, the student will identify 1 state climate and crop pattern. The student will draw a scale model of the climate and crop pattern as well as write a 2 page descriptive research paper about the climate pattern which will be assessed using a 3 point rubric with the student needing to show proficiency by scoring at least 15 points.

By the end of the lesson, the student will demonstrate common knowledge of the key terms that will be reviewed in this lesson by correctly answering 7 of the 10 questions, which will be measured by a teacher made test.

**Anticipatory Set**

The student will watch a few videos entitled: "Effects of climate change on crops" these videos discuss climate and crops. Particular attention is given to the climate regions of the United States. The teacher will then question the students to reflect about the video. As well as some added questions by the teacher. Some of the question the teacher will ask:

        What do you think about the videos?

        Why is climate and important element for the growth of crops?

        What is a common type of climate within the US?

        Does Florida have the perfect climate?

        Would you like to live in a state that produces your favorite produce?

**Hypotheses**

The teacher will provide the student with the following sample hypotheses. Students are encouraged to generate their own hypothesis.

* If there is a relationship between climate and crop growth, then increased exposure to warm climate will result in an increase in crop growth.
* If there is a relationship between climate and crop growth, then increased exposure to humid climate will result in an increase in crop growth.
* If there is a relationship between climate and crop growth, then increased exposure to cold climate will result in an increase in crop growth.
* If there is a relationship between climate and crop growth, then increased exposure to continental climate will result in an increase in crop growth.

**Data Collection and Analysis**

The teacher will give the instructions to the students in the collection and analysis of data as follows:

1. The students will be divided into groups of four or five and formalize hypotheses from which to begin their studies.
2. The teacher will require students to take notes on their research. Collect information on things that support climate effects on plant growth and things that contradict it.
3. The teacher will model hypothesis formulation giving students at least three examples of sample hypotheses.
4. Each group will search the internet for information of the types of climate that were discussed in the lesson.
5. The groups should discuss their hypotheses to see if they made correct inferences.
6. Each group will share the information founded on climates and plant growth and their hypothesis with the class.
7. As a class, each hypothesis should be discussed and analyzed. The teacher will evaluate the understanding of the student by asking questions.
8. The teacher will review the key concepts and facts, preparing the student to do their research papers.
9. The research paper should be presented as a group activity where all the members of the group should investigate and analyze the subject.
10. The student will make a Draw Conclusions Chart (What I know and My Conclusions) as a homework after all the presentations and the discussions of the hypothesis have been made. The students will have to do the reflection paper as an individual assignment about the effect that climate has on plant growth.

**Conclusion**

The student present to the classroom the evidence collected which will prove or disprove the hypothesis. The student will explain the method in which the data was collected.

While the groups are presenting to the class their findings, the others students should get actively involved by asking questions related to the topic and taking important notes.

After the presentations, the students will have to present their scale drawing of a particulars state climate and crop growth.

**Generalization**

Testing against new evidence: The teacher will help to develop generalizations about climate and plant growth:

* The students will discuss the possible consequences that poor climate can have on crop growth.
* The students will discuss the possible consequences that an over exposure to climate can have on planet growth.

The student will make a statement to prove or disprove the hypothesis based upon the research and conclusion.

**For example: Having found a relationship between tropical climate and crop growth, we can conclude that the increase in tropical climate will result in an increase in crop growth.**

**Summary**

As a result of this lesson, the student will:

* Understand the effects of climate on crop growth.
* Discuss their findings and their reflections on the observations made throughout the lesson.
* Distinguish between the different types of climate.

**Evaluation**

Evaluation will be based on the rubrics attached.